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DATA BRIEF

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CONTIN

1993 Spending Falls for U.S. Industrial R&D, Nonmanufacturing Share Increases

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> *Reduced Federal funding in 1993 caused an overall decline in U.S. industrial R&D, to $118.3 billion.*

The National Science Foundation's latest Survey of Industrial Research and Development shows that firms spent $118.3 billion on research and development (R&D) in the United States during 1993, 1 percent less than during 1992. The 8-percent decline in Federal funding, from $24.7 billion to $22.8 billion, more than offset the 1-percent increase in R&D funding from company and other nonfederal sources, from $94.4 billion to $95.5 billion. Adjusted for inflation, funds from both sources dropped, Federal by 10 percent and nonfederal by 1 percent, resulting in a 3-percent constant-dollar decrease in total R&D.

Sources of R&D Support

Federal support as a share of total industrial R&D continued to decline from its recent peak of 33 percent in 1987 to 21 percent in 1992 and to 19 percent in 1993. Among specific manufacturing industries, Federal support increased for R&D performed by petroleum extractors and refiners, drug and medicine manufacturers, and makers of professional and scientific instruments. The share of total R&D supported by Federal funds for the first two groups increased but remained below 1 percent; the Federal share increased from 23 percent to 27 percent for makers of professional and scientific instruments. Manufacturers of drugs and medicines, electrical and transportation equipment, and professional and scientific instruments performed more company-financed R&D, whereas petroleum extractors and refiners and machinery manufacturers performed less during 1993 than they did during 1992. The share of total R&D supported by Federal funds to electrical equipment manufacturers decreased from 29 percent to 11 percent; from 41 percent to 38 percent for transportation equipment manufacturers; and from 7 percent to 1 percent for machinery manufacturers. For nonmanufacturers the share of total R&D supported by Federal funds decreased from 19 percent to 18 percent. Table 1 gives summary statistics from the 1993 survey and compares them with revised statistics for 1992.

Survey Changes

NSF's Survey of Industrial R&D has been conducted annually since 1954. During the early years the focus of the survey was on manufacturing industries, in which R&D performance was heavily concentrated. Beginning in the early 1970s, the need for more detailed information on the R&D performed by firms in the nonmanufacturing sector was recognized, and the survey gradually has been changed to collect more detailed statistics for this sector. The latest changes, put into place for the 1992 survey, included the addition of 25 new industries from the nonmanufacturing sector and more small firms from both sectors to the survey. The previous Data Brief in this series (NSF 94-317) and the report *Research and Development in Industry: 1992* (NSF 95-324) discuss these survey changes and their impact on the statistics.

Nonmanufacturing R&D Trends

The trend of U.S. business toward services and other nonmanufacturing activities is well known. The NSF survey provides statistical evidence that increasing levels of R&D also are being performed by nonmanufacturing firms. During 1963-93 the share of R&D grew substantially. Estimates from the 1963 survey show that only 2 percent of R&D was conducted by nonmanufacturing firms. The share increased to 3 percent for 1973, 5 percent for 1983, and 11 percent for 1988. During the next 5 years, the reported share more than doubled, to 26 percent for 1993, although part of the increase may have resulted from the NSF survey's sample redesign. For the first two decades of the period, 1963-83, the inflation-adjusted annual rate of increase in the amount of R&D performed by nonmanufacturing firms was 7 percent; for the last decade, 1984-93, the annual rate was 19 percent.

It is difficult to determine precisely how much of this expansion resulted from changes in the R&D activity of firms that have remained within the nonmanufacturing sector and how much resulted from movement of firms formerly classified as manufacturers into the nonmanufacturing classifications. By comparing sales (not shown here) and R&D figures from the 1993 survey with those from the 1992 survey, it appears that an undetermined number of firms shifted out of the industry classifications for machinery, which include manufacturers of office, computing, and

Electronic Dissemination

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accounting machines, and into services. Consistent with this shift, reported R&D for machine manufacturing firms dropped from $15 billion for 1992 to $8 billion for 1993.

Further revisions to the survey's sample design are planned using knowledge gained from the 1992 and 1993 surveys. While maintaining and possibly expanding the level of detail available for manufacturers, the survey will continue to be strengthened and refined to capture more information on the R&D performance by the increasingly important nonmanufacturing industries.

This Data Brief is the first publication of statistics and information from the 1993 Survey of Industrial Research and Development. The annual report, *Research and Development in Industry: 1993*, will contain the full data set (approximately 50 tables) available from the survey. While the annual report is being prepared, a selected data set (18 tables) is available from the address below. Both the selected data tables and the annual report will present statistics by industry and by size of company on the sources of funds for and character of industrial R&D; historical trends in R&D; R&D as a percent of sales; R&D contracted out and performed outside the United States; sales and total employment of R&D-performing companies; and employment and cost of R&D scientists and engineers. The annual report also will present statistics on total R&D by State, type, and size of R&D program as well as technical information on the survey sample and processing and additional analysis of the statistics.

Table 1. Funds for industrial R&D, by source, industry, and size of company: 1992-93

Source of funds, industry, and size of company	1992	1993	Percent change 1992-93	1992	1993	Percent change 1992-93
	Millions of current dollars			Millions of 1987 dollars		
Total	**119,110**	**118,334**	**-0.7**	**98,519**	**95,817**	**-2.7**
By source and performing industry:						
Company and other non-Federal, total	**94,388**	**95,521**	**1.2**	**78,071**	**77,345**	**-0.9**
Drugs and medicines	7,934	9,133	15.1	6,562	7,395	12.7
Petroleum refining and extraction	2,268	2,103	-7.3	1,876	1,703	-9.2
Machinery (including computers)	13,903	8,182	-41.1	11,500	6,625	-42.4
Electrical equipment	9,516	11,285	18.6	7,871	9,138	16.1
Transportation equipment	16,292	17,063	4.7	13,476	13,816	2.5
Professional/scientific instruments	7,321	7,521	2.7	6,055	6,090	0.6
Nonmanufacturing industries	23,363	25,538	9.3	19,324	20,679	7.0
Federal, total	**24,722**	**22,813**	**-7.7**	**20,448**	**18,472**	**-9.7**
Drugs and medicines	11	15	36.4	9	12	33.5
Petroleum refining and extraction	9	14	55.6	7	11	52.3
Machinery (including computers)	1,035	88	-91.5	856	71	-91.7
Electrical equipment	3,844	1,402	-63.5	3,179	1,135	-64.3
Transportation equipment	11,202	10,438	-6.8	9,266	8,452	-8.8
Professional/scientific instruments	2,221	2,767	24.6	1,837	2,240	22.0
Nonmanufacturing industries	5,570	5,784	3.8	4,607	4,683	1.7
By size of company:						
Fewer than 500 employees	13,557	15,481	14.2	11,213	12,535	11.8
500 to 999 employees	7,958	3,198	-59.8	6,582	2,589	-60.7
1,000 to 4,999 employees	11,886	13,277	11.7	9,831	10,751	9.4
5,000 to 9,999 employees	8,258	9,023	9.3	6,830	7,306	7.0
10,000 to 24,999 employees	15,744	15,105	-4.1	13,022	12,231	-6.1
25,000 or more employees	61,707	62,250	0.9	51,040	50,405	-1.2

SOURCE: National Science Foundation/SRS, Survey of Industrial Research and Development

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